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Autobiographical memory and trauma in adolescents☆

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Abstract

Several clinicians who work with traumatized children have noted that these children exhibit a poor autobiographical memory. The present study was a first attempt to subject this clinical impression to formal testing. Memory for autobiographical facts (i.e., semantic autobiographical memory) was assessed in 10 adolescents with an alleged history of trauma and 17 adolescents without such a background. Results suggest that traumatized adolescents, indeed, have more difficulty with semantic personal memory than non-traumatized adolescents. Implications of the present findings for future research on trauma and autobiographical memory in children and adolescents are discussed.

Keywords: Trauma; Autobiographical memory; Adolescents

1. Introduction

Clinicians treating abused children have frequently noted that these children tend to have difficulty with generating autobiographical memories. This difficulty would not pertain to traumatic memories per se, but rather to autobiographical memory in general (e.g., Courtois, 1988; Sgroi, 1989). That is, traumatized children would exhibit

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memory gaps "for months or years, not just for infancy and early childhood (which is normal) but for primary school ages and older" (Sgroi, 1989, p. 112). Whether this clinical impression is correct is not clear, because empirical studies that directly address this issue are lacking (Lindsay & Read, 1994). There is, of course, an extensive body of literature concerned with the development of autobiographical memory in "normal" children (e.g., Harley & Reese, 1999; Howe & Courage, 1997; Nelson, 1993). Additionally, several studies have examined the way in which children recollect traumatic incidents (e.g., Eth & Pynoos, 1994; Terr et al., 1996). However, to the authors' knowledge, autobiographical memory deficits of traumatized children have not been systematically studied.

A recent study by Melchert and Parker (1997) provides little support for the idea that traumatic childhood events are related to a poor memory for childhood. In that study, 429 adults were asked if they had ever been exposed to abusive experiences during their childhood. In addition, participants were questioned about the quality of their childhood memories. The researchers failed to find a relationship between a history of alleged trauma and vague childhood memories. However, the Melchert and Parker (1997) study is far from convincing for two reasons. First, this study asked *adults* (age range 18–54 yr) about their earliest childhood memories. Second, participants gave a global and subjective ("meta-memory") opinion about the quality of their childhood memories.

Meanwhile, there are some studies that are consistent with the clinical impression of poor autobiographical memory in abused children. For example, autobiographical memory has been examined in adults with combat-related (McNally, Lasko, Macklin & Pitman, 1995) and rape- and incest-related (Parks & Balon, 1995) posttraumatic stress disorder (PTSD). The results of these studies indicate that a history of trauma is associated with what is termed "overgeneral" autobiographical memory (see Williams, 1996, for an overview). That is, traumatized individuals asked to retrieve memories of specific events tend to report inappropriately general memories. As to the mechanisms that underlie overgeneral memory, two explanations have been put forward. The first one is mainly based on the pioneering work of Williams and colleagues and assumes that traumatic experiences might foster a particular cognitive style (Williams, 1992; Williams & Broadbent, 1986). Individuals with that style would habitually focus on the affective features of events and therefore, would tend to encode events in rather global terms. In Williams (1992) words: "of all the multiple levels at which an episode can be encoded, the levels that carry most affect are the more general, because they evaluate behaviors according to longer term criteria" (p. 470). A second explanation emphasizes the intrusive thoughts of traumatized individuals (e.g., Kuyken & Brewin, 1994; McNally, English & Lipke, 1993). By this view, intrusive memories would consume cognitive resources and this would interfere with the retrieval of specific autobiographical memories. This hypothesis is supported by the experiment of McNally and colleagues who found that Vietnam combat veterans with PTSD had more difficulty retrieving specific autobiographical memories after exposure to a combat videotape (McNally, Litz, Prassas, Shin & Weathers, 1994). Note that both interpretations of overgeneralized autobiographical memory are not mutually exclusive.

In sum, there is strong evidence for an association between autobiographical memory deficits and trauma in adults. However, it remains to be seen whether such an association can be found in traumatized children and adolescents. The present study addressed this issue, and compared memory for autobiographical facts in traumatized adolescents with that in a non-traumatized control group. Why is it important to examine the connection between trauma and autobiographical memory in children and adolescents? Apart from being relevant to memory researchers, the study of this connection might also be of practical relevance. In their thought-provoking review, Lindsay and Read (1994, p. 323) made the following commentary about this practical aspect: "In line with earlier suggestions (...), we propose that memory researchers could make a valuable contribution to clinical practice by devising a test of childhood autobiographical memory that is both reliable and age-appropriate (age at the time of testing). It should be recognized, however, that such assessment techniques would not determine the accuracy of clients' autobiographical memories. Instead, comparisons could be made to norms for recall by non-abused controls; if future research indicated that known survivors of childhood abuse do in fact have poorer memories of childhood than do controls, then the assessment techniques could be used in conjunction with other measures and techniques to improve the diagnosis of repressed memories". The present study did not aim at developing a reliable test of childhood autobiographical memory. Rather it examined the less ambitious issue of whether traumatized adolescents have a poorer memory for autobiographical facts than controls. Clearly, developing a test of childhood autobiographical memory as a practical tool for assessing the presence or absence of a traumatic history would only make sense if the connection between trauma and poor memory is well established.

2. Method

2.1. Participants

Twenty-seven adolescents (19 girls and 8 boys) volunteered to participate in the study. Their mean age was 16 yr (SD = 1.3; range 14–19). All were residents of an urban institution for youth care. Participants either had an alleged history of trauma ($n = 10$) or were admitted to the institution for other reasons (e.g., oppositional behavior; $n = 17$). Trauma was broadly defined and included physical maltreatment ($n = 3$), neglect ($n = 3$), and sexual abuse ($n = 4$). Participants' background (i.e., trauma versus control) was established on the basis of their records. These records contained extensive information about the family situation of each adolescent. A research assistant screened all available records and wrote concise summaries of them. In this way, 36 adolescents were initially selected. Following this, the four authors independently evaluated the record information and classified each participant as either having a traumatic background or belonging to the control group. If there was no consensus between the four authors about a case, it was excluded from the sample. This procedure resulted in a final sample of 27 adolescents. Thus, classification of participants was done on the basis of file information about which the authors had

reached consensus. It should be kept in mind that this procedure is not without problems. The possibility of inaccurate composed samples remains. However, it is reasonable to argue that, under these suboptimal conditions, any effects in the expected direction are an underestimation of the real effects.

2.2. Measures and procedure

Participants were tested individually in sessions that took about 30 mins. Apart from an autobiographical memory test, participants completed a test to assess semantic long-term memory and a brief depression questionnaire (see below). These measures were included, because depression and general memory capacity may be related to performances on an autobiographical memory task. After a short introduction, the following instruments were administered:

Story: This measure is a story recall test (Lezak, 1995) derived from the Binet-Bobertag and is widely used in the Netherlands. It assesses a person's ability to encode and reproduce meaningful, verbal associative information. A neutral short story is read out to the subject, who is then asked to reproduce the narrative as accurately as possible (Story 1). Semantic long-term memory is measured by asking the subject to reproduce the story after a time interval of 15 min without reading the story again (Story 2). Story consists of 20 meaningful elements; Accordingly, memory scores may vary between 0 and 20. Two parallel versions are available (form A and form B). In the current study, form A was used (Bouma & Lindeboom, 1983).

Depression questionnaire: A self-report questionnaire was employed that contained 14 items derived from the Dutch version of the Youth Self Report (YSR). The YSR is modeled after the Child Behavior Checklist (CBCL; Achenbach, 1991; Verhulst, van der Ende & Koot, 1996). The CBCL is a widely used reliable and valid instrument, which covers a broad range of emotional and behavioural problems as well as social competency in children and adolescents. A translated and standardized version is available in the Netherlands (Evers, van Vliet-Mulder & ter Laak, 1992). The adolescent is requested to rate each item on a 3-point scale (0 = *not true*, 1 = *somewhat or sometimes true*, and 2 = *very true or often true)*. All items refer to the period of the past six months.

Semantic autobiographical memory test (*SAMT*): This questionnaire was designed for the purpose of the present study and consisted of 22 items. The items are focused on the so-called "personal facts" or self-referent semantic knowledge (Kihlstrom & Schacter, 1995). The SAMT items were strongly inspired by the work of Kopelman (1994). Note that the items were not concerned with traumatic memories or events. Rather they had to do with relatively neutral and personal facts such as "the name of the street you lived on", "a boy- or girl friend's name you frequently played with" and the like. Participants were instructed that the items pertained to the period they were aged 12. The items had a dichotomous response format. A sample item would be: "Do you remember the name of your elementary school?" (Yes/No); If "Yes": "What was its name?". A "yes"-answer was only accepted if participants were able to produce some details (e.g., gave a name). Some participants were unable to answer certain

items, simply because the items were not relevant to the participants (e.g., the item "Do you know what type of car your family was driving then?" If "yes", what type was it? when, in fact, the participant's family never possessed a car). Therefore, a total SAMT score was calculated by summing up the number of correct responses divided by the total number of items minus the number of non-relevant items. Accordingly, total SAMT scores ranged between 0 and 1. The Appendix lists all SAMT items.

Tests were administered in the following order: Story 1, Depression Questionnaire, Story 2, and SAMT. Participants received a small financial compensation for their cooperation.

3. Results

Table 1 summarizes information about age, sex, depression and memory scores of both groups. As can be seen, the trauma and the control group did not differ with regard to sex or age. Likewise, the groups did not differ in terms of immediate (Story 1) or delayed (Story 2) story recall. On the average, adolescents in both groups reproduced about 16 out of 20 meaningful elements, indicating that encoding and storage of verbal, associative material was adequate.

As anticipated, traumatized adolescents had somewhat higher scores on the Depression Questionnaire than controls (14.5 vs. 11.4). Yet, this difference was only marginally significant, ($p = 0.07$). The hypothesis that adolescents with a history of trauma have more difficulty with personal facts than adolescents without such

Table 1
Demographic characteristics and mean scores (SDs) on encoding (Story 1) and long-term memory (Story 2) of non-self-referent material, depression and autobiographical memory of traumatized and control participants

	Trauma	Control	χ^2 (df = 1) t (df = 25)	p
Boys	3	5	0.001	0.97
Girls	7	12		
Age	16.5 (1.3)	16.1 (1.4)	0.82	0.42
Story 1	15.6 (1.8)	16.1 (2.8)	− 0.46	0.65
Story 2	15.2 (2.2)	15.7 (2.7)	− 0.50	0.62
Depression	14.5 (5.6)	11.4 (4.9)	1.52	0.07[a]
Autobiographical memory	0.78 (0.23)	0.90 (0.08)	− 1.87	0.037[a]

[a] One-tailed.

Table 2
Pearson product-moment correlations between story 1, story 2, depression, and autobiographical memory ($N = 27$)

	Story 1	Story 2	Depression	Autobiographical memory	Age
Story 1	—	0.94[a]	−0.11	0.06	−0.20
Story 2		—	−0.17	0.23	−0.25
Depression			—	−0.19	−0.13
Autobiographical memory				—	−0.15
Age					—

[a] $p < 0.001$, two-tailed.

a history was supported: the trauma group had significantly lower SAMT scores than the control group (0.78 vs. 0.90, $p = 0.037$).[1]

Pearson product-moment correlations between Story 1, Story 2, depression, autobiographical memory, and age are presented in Table 2. As can be seen, Story 1 and Story 2 were strongly correlated. The remaining correlations were all non-significant. Thus, there was no association between autobiographical memory and semantic long-term memory (Story 2) and neither was there a reliable connection between autobiographical memory, age, and depression.

4. Discussion

The present findings indicate that adolescents with an alleged history of trauma have more difficulty with reporting autobiographical facts than non-traumatized adolescents. This difficulty cannot be accounted for in terms of age, depression or semantic long-term memory, since correlations between age, depression and long-term memory, on the one hand and autobiographical memory, on the other hand were non-significant.

Before discussing the implications of these findings, several methodological limitations of the present study should be noted. To begin with, classification of participants as either "traumatized" or "control" was based on file information. This procedure introduces a number of potential difficulties that have been extensively described in literature (e.g., Horowitz et al., 1995). For example, a number of the screened records were found to be incomplete or inconclusive, and so a reliable judgment was

[1] Results of an analysis of covariance (ANCOVA), with autobiographical memory being the dependent variable and controlling for depression and semantic long-term memory indicated that the difference between both groups on the AMQ still remained significant.

impossible. As a result, nine participants were excluded from the study which reduced the statistical power of our tests. Furthermore, there was no absolute guarantee that participants that were included were classified correctly. While participants were only assigned to the trauma group if their records contained credible evidence for abuse or neglect (e.g., court action), it remains possible that some of the control participants had, in fact, a traumatic history. Note, however, that this limitation can be used as an a fortiori argument: it makes the difference in autobiographical memory performance even more striking. Second, for reasons of privacy it was impossible to verify the subjects' statements in the current study. As a consequence, we have no hard proof of the accuracy of their responses. Note however, that this applies to both traumatized and non-traumatized adolescents. A third shortcoming has to do with the semantic autobiographical memory test (SAMT) used in the present study. The SAMT was inspired by the work of Williams (Williams & Broadbent, 1986) and Kopelman (1994) and was developed for the purpose of the present study. As a consequence, extensive psychometric data about this instrument are not available. The findings also suggest a ceiling effect in the control group. That is, a substantial number of control adolescents obtained a maximum SAMT score. Perhaps, then, the SAMT contains not enough items to detect variability in controls' autobiographical memory performance. Germane to this issue is the fact that the present study asked participants to recollect autobiographical memories from the period that they were 12 yr old. In this way, a relatively narrow domain of personal memories was addressed. In contrast, the *autobiographical memory interview* developed by Kopelman, Wilson and Baddeley (1989) for adult patients, covers several age ranges (e.g., preschool years, elementary school years, and so forth). It may well be the case that an autobiographical memory test containing more items and covering more age ranges would have revealed stronger differences between both groups in the expected direction and, possibly, correlations with depression scores. Finally, participants were told that the autobiographical memory questions focused on the period that they were 12 yr old. Hence, some of the facts from 2 to 4 yr ago may still hold true today, which might have affected the present findings. This again underlines the importance of covering distinct age ranges when exploring autobiographical memories.

Despite these limitations, the results of the present study support and extend previous research on trauma and autobiographical memory in adults. To our knowledge, this previous work in adults focused almost exclusively on the ability to retrieve specific autobiographical events (see for a review Williams, 1996). The present findings suggest that trauma may also be associated with impaired performance on a test of autobiographical memory facts. This is in line with the clinical impression that children who have experienced trauma exhibit poor autobiographical memory (e.g., Sgroi, 1989). There is no consensus as to the mechanism underlying the association between trauma and poor autobiographical memory. Some authors have argued that poor autobiographical memory is not specific for traumatized adults but may also occur in major depression (e.g., Wessel, Meeren, Peeters, Arntz & Merckelbach, 2000; Wilhelm, McNally, Baer & Florin, 1997; Williams & Broadbent, 1986; Williams & Dritschel, 1988). Yet, others found little evidence for the idea that depression and intrusive cognitions are major antecedents of poor autobiographical memory

(Merckelbach, Muris & Horselenberg, 1996) and they suggest that traumatization is the most important causal factor (e.g., Kuyken & Brewin, 1995). Although the present results appear to be consistent with the latter position, one should be wary of jumping to conclusions. It should be noted in this regard, that traumatized subjects reported (marginally significant) higher levels of depression than their non-traumatized counterparts.

The present study was explorative and its results warrant further examination of the link between trauma and autobiographical memory in children and adolescents. Most importantly, the SAMT has to be extended, validated, and standardized in follow-up large-scale research. In addition, there is a need for more controlled studies, comparing clinical samples (e.g., children with post traumatic stress disorder) to "normal" control groups. Such a line of research not only has a practical purpose (e.g., testing clinical impressions), but may also introduce an important change in the trauma-memory debate. In its current phase, this debate concentrates on issues like "how reliable are traumatic memories?" and "what role does psychotherapy play in recovering traumatic memories which are supposed to be repressed or dissociated?" (e.g., Lindsay & Read, 1994). Findings such as reported in this article emphasize the possible role of trauma in general autobiographical memory rather than in traumatic memories per se. The present results together with findings from studies on adult patients (see Williams, 1996) suggest that this a promising perspective.

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Appendix A. Semantic autobiographical memory test (SAMT)

Instruction: I am going to ask you a series of questions that are concerned with your personal memories. Note, however, that this is not an examination. Therefore, it does not matter if you are unable to answer certain questions.

Note: each question refers to the period of time that you were about 12 yr old!

1. Do you remember the name of your elementary school? yes/no
   If yes: What was its name? .....
2. Do you remember your best friend's name in elementary school? yes/no
   If yes: What was his or her name? .....
3. Do you remember the name of the street you lived on during that period? yes/no
   If yes: What was that street called? .....
4. Do you remember the number of your house? yes/no
   If yes: What was the number? .....

5. Do you know what type of car your family was driving then? yes/no
   If yes: What type of car did they drive? .....
6. Do you still know the name of your teacher in grade 6? yes/no
   If yes: What was his/her name? .....
7. Do you remember the (last) names of your family's neighbours? yes/no
   If yes: What were their names? .....
8. Do you remember your favourite subject in elementary school? yes/no
   If yes: What was your favourite subject? .....
9. Do you remember your family's holiday place when you were 12? yes/no
   If yes: What was its name? .....
10. Do you know the colour of the wallpaper of your room when you were aged 12? yes/no
    If yes: What colour was it? .....
11. Do you remember the colour of your bike when you were 12 yr old? yes/no
    If yes: What colour was it? .....
12. Do you remember the name of your favourite television programme or soap when you were aged 12? yes/no
    If yes: Which programme or soap was it? .....
13. Do you know which garment you mostly preferred to wear when you were 12? yes/no
    If yes: What was it? .....
14. Do you remember your favourite song at the age of 12? yes/no
    If yes: What was the title of that song? .....
15. Do you know the name of the boy or girl you most frequently quarreled with when you were 12? yes/no
    If yes: What was his/her name? .....
16. Do you remember the name of the game you enjoyed most at the age of 12? yes/no
    If yes: What was the name of that game? .....
17. Do you remember which subject you had most trouble with in grade 6? yes/no
    If yes: Which subject was it? .....
18. Do you remember how you were dressed up at Carnival in grade 6? yes/no
    If yes: How? .....
19. Do you know the destination of your class trip in grade 6? yes/no
    If yes: What destination was it? .....
20. Do you remember how much spending money a week you got when you were 12 yr old? yes/no
    If yes: How much money was it? .....
21. Do you remember the colour of your family's kitchen at the age of 12? yes/no
    If yes: What colour was it? .....
22. Do you know the name of your favourite rock band when you were 12 yr old? yes/no
    If yes: What was the name of that band? .....

Possible remarks/observations:

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